

**Synoptic Evaluation of Drinking Water Constituents of
Concern in the Sacramento and San Joaquin River Basins**

Final Monitoring Plan

November 2014

TABLE OF CONTENTS	PAGE
I. INTRODUCTION	3
II. BACKGROUND	3
III. STUDY DESIGN OVERVIEW	4
III.a. Monitoring Design.....	6
III.b. Sampling Locations	6
III.c. Parameters	10
III.d. Frequency of Sampling.....	20
III.e. Spatial and Temporal Scale.....	20
III.f. Data Management	20
IV. REVIEW STRATEGY	20
V. QUALITY ASSURANCE	20
V.a. Field Equipment	21
V.b. Laboratory Methods and Costs	21
VI. REFERENCES	23

List of Tables

Table 1 Monitoring Sites (Water bodies are in bold)	7
Table 2 List of Constituents within Each Scan including RLs and MDLs	11
Table 3 Laboratory Costs for Key Constituents and All Scans.....	21
Table 4 Estimated Analytical Cost by Study Area.....	22

List of Figures

Figure 1 Study Area	5
Figure 2 Sacramento River Monitoring Sites	8
Figure 3 San Joaquin River Monitoring Sites	9

APPENDIX A: PARAMETERS AND CRITERIAS	24
---	-----------

I. INTRODUCTION

This plan documents the monitoring aspects of the Synoptic Evaluation of Drinking Water Constituents of Concern in the Sacramento and San Joaquin River Basins conducted during June 2014. The purpose of this study is to evaluate current water quality data within representative agricultural drains and main stem Sacramento and San Joaquin river sites against Maximum Contaminant Levels (MCLs) specified in provisions of Title 22 of the California Code of Regulations, California Toxics Rule (CTR) criteria, and other numeric water quality criteria listed in Appendix A for constituents without a MCL or CTR criteria developed to protect human health. Sampling of the study's 11 sites will be conducted over two days, and each designated site will be sampled once for this study.

Sampling sites consist of:

- Locations that are utilized by other programs gathering water quality data
- Locations at representative agricultural drains
- Locations in the main river stems upstream and downstream of agricultural drain inflows

Parameters analyzed include standard field measurements, bacteria (coliform and *E. coli*), and constituents encompassed by Maximum Contaminant Limits (MCLs) specified in provisions of Title 22 of the California Code of Regulations for potable water in order to protect human health. In addition, select California Toxic Rule (CTRs) constituents will be monitored. *E. coli* results will be evaluated using the 200 MPN/100mL California Department of Public Health evaluation criteria.

II. BACKGROUND

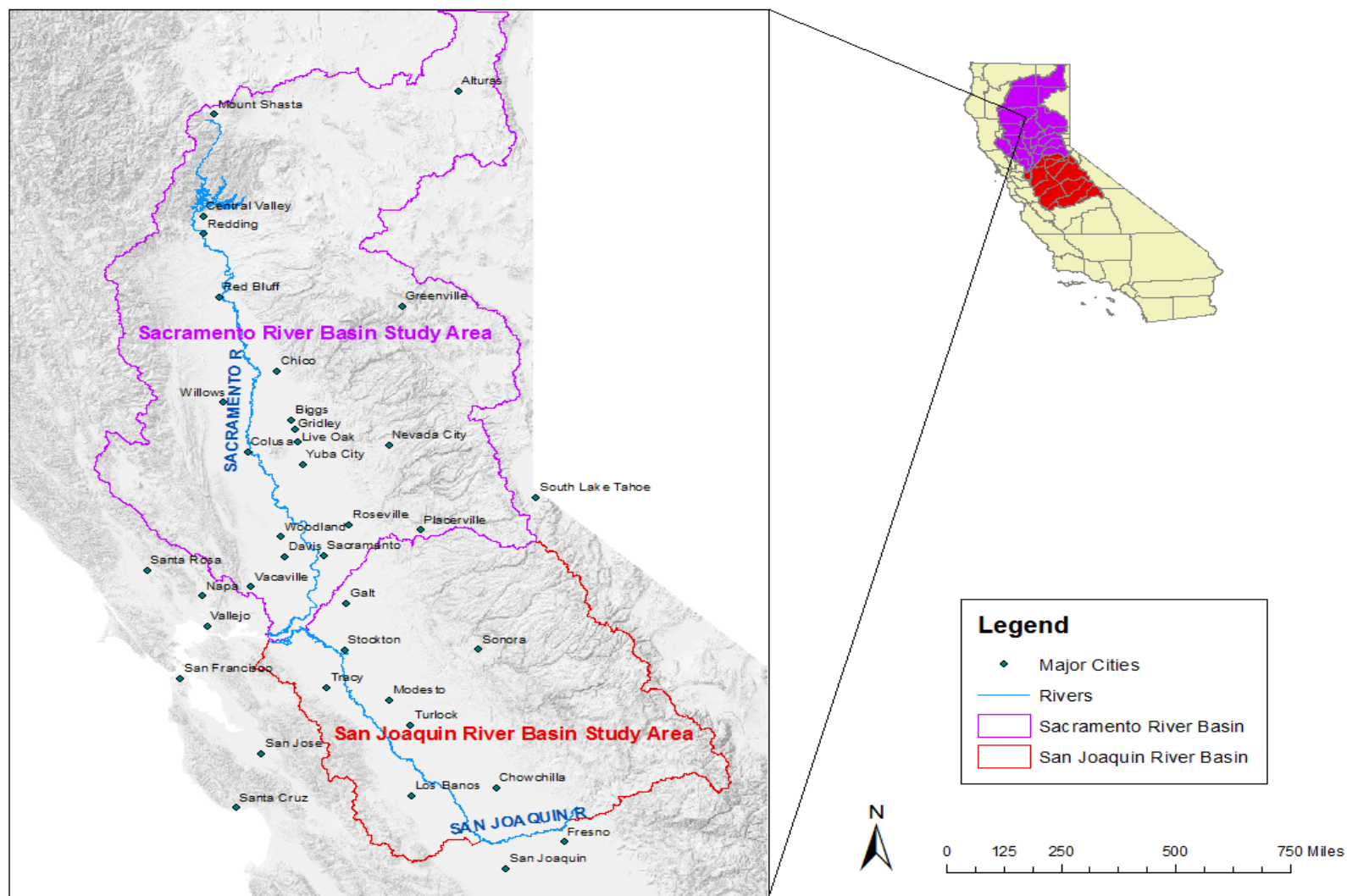
Via the State Water Resources Control Board Sources of Drinking Water Policy (88-63), the Central Valley Regional Water Quality Control Board Basin Plans (Basin Plans) designate with the Municipal and Domestic Supply (MUN) beneficial use to all water bodies unless they are specifically listed as water bodies without MUN. The Basin Plans state that water bodies designated for MUN must not exceed MCLs for chemical constituents, pesticides, and radionuclides.

This project will provide a snapshot of the water quality within select agricultural dominated drains and sites along the main stem of the San Joaquin and Sacramento Rivers as compared to criteria developed to protect human health.

III. STUDY DESIGN OVERVIEW

This Monitoring Plan has been formatted to reflect California's Surface Water Ambient Monitoring Program's (SWAMP's) template. The following sections provide details of the plan, including questions to be answered, constituents to be analyzed, sampling sites and frequency. Figure 1 displays the study area.

Figure 1 Study Area



Synoptic Evaluation of Drinking Water Constituents of Concern in the Sacramento and San Joaquin River Basins Final Monitoring Plan, Nov 2014

III.a. Monitoring Design

This monitoring effort will evaluate water quality along the Sacramento River and San Joaquin River against criteria developed to protect human health; specifically the Title 22 primary and secondary MCLs and select constituents identified in the California Toxics Rule. The analytes and their associated criteria are listed in Appendix A. Not all of the analytes listed in Appendix A were analyzed for this study.

The main question being asked by this study is:

1. During a one time snapshot of the irrigation period, do agricultural return flows exceed or cause the main stems of the Sacramento and/or San Joaquin Rivers to exceed potable water quality criteria?

The primary objectives of this project are:

- Collect representative samples in main agricultural drains discharging into either the Sacramento or San Joaquin Rivers and the rivers themselves;
- Determine spatial distribution of any detectable constituent concentrations of concern; and,
- Identify whether criteria developed to protect human health are exceeded.

All aspects of this study, including all samples and field measurements collected, will be conducted in accordance with the Procedures Manual for the San Joaquin River Water Quality Monitoring Program (Central Valley Water Board, 2010) which is compliant with the 2008 SWAMP Quality Assurance Program Plan (QAPrP) for the State of California's Surface Water Ambient Monitoring Program (State Water Board, 2008).

III.b. Sampling Locations

Eleven sites have been selected for sampling (Table 1). Sites were selected based on accessibility, presence of water, agricultural area drained, and for the main stem rivers, proximity to agricultural drains. Consideration was also given to potential use of the resulting data by other programs and agencies. Figures 2 and 3 are maps of the sampling locations.

Table 1 Monitoring Sites (Water bodies are in **bold**)

Location	Map Label	Station Code	Sites	Latitude	Longitude
Sacramento River	37	520CBDKLU	Colusa Basin Drain above Knights Landing	38.7992	-121.725
	38	520CRCOOH	Sutter Bypass downstream of Obanion Outfall	39.0258	-121.7272
	39	520YOL001	Sacramento River at Rough and Ready Pumping Plant	38.8621	-121.7927
	40	519SACVER	Sacramento River Below Verona	38.7797	-121.6037
San Joaquin River	30	541MER531	Salt Slough at Lander Avenue	37.24797	-120.85225
	31	541XSSASD	Salt Slough at Sand Dam	37.13664	-120.76194
	32	541MER050	Boundary Drain at SLCC Sampling Station	37.10949	-120.78275
	33	535STC504	San Joaquin River at Crows Landing	37.43323	-121.01597
	34	535STC501	Harding Drain	37.46444	-121.03028
	35	541SJC501	San Joaquin River at Airport Way near Vernalis	37.67556	-121.26417
	36	541STC516	Del Puerto Creek at Vineyard Road	37.52139	-121.14861

NOTE: Map Labels match locations depicted in Figures 2 and 3.

Water Quality Evaluation Site Maps

Figure 2 Sacramento River Monitoring Sites

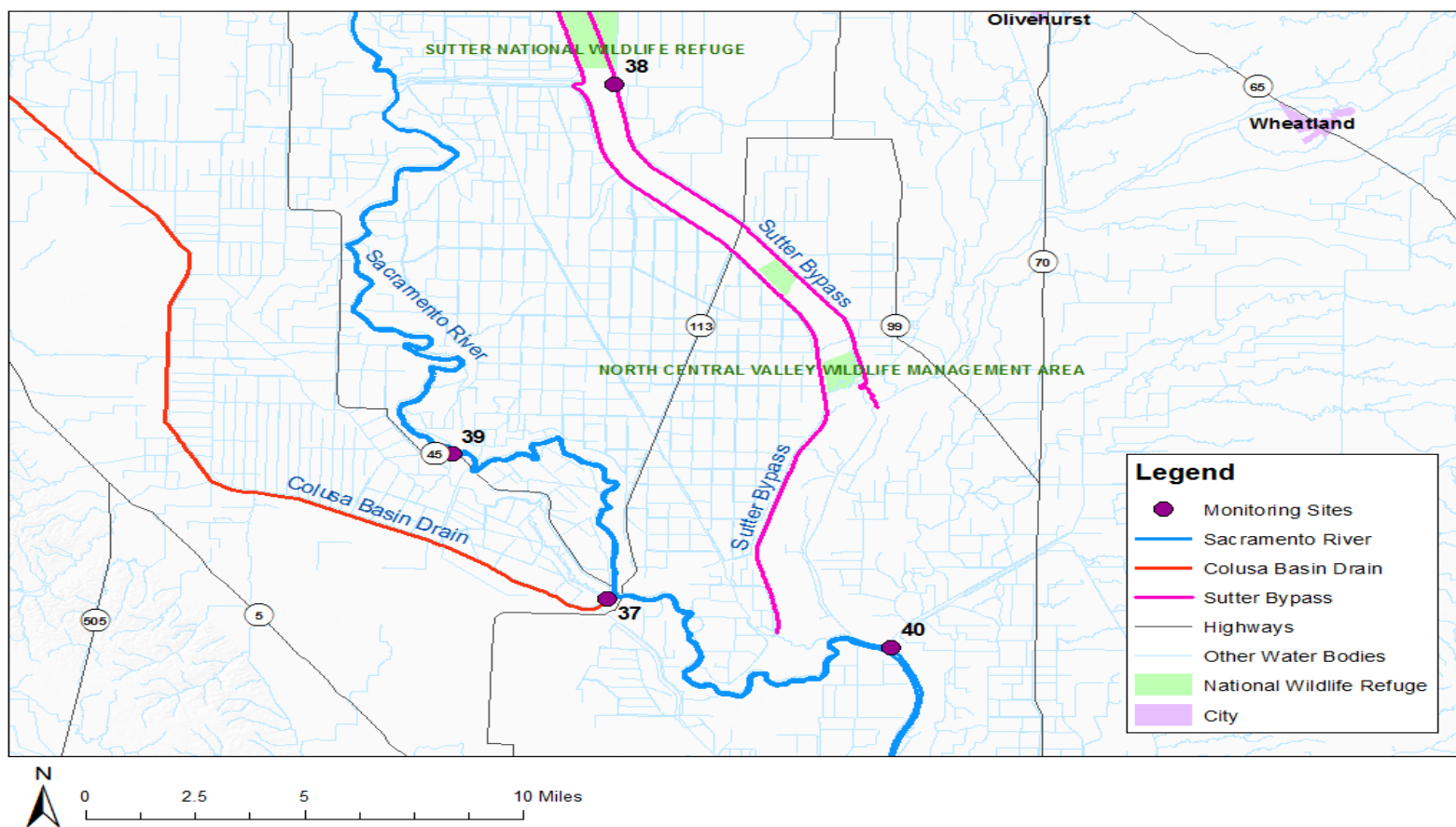
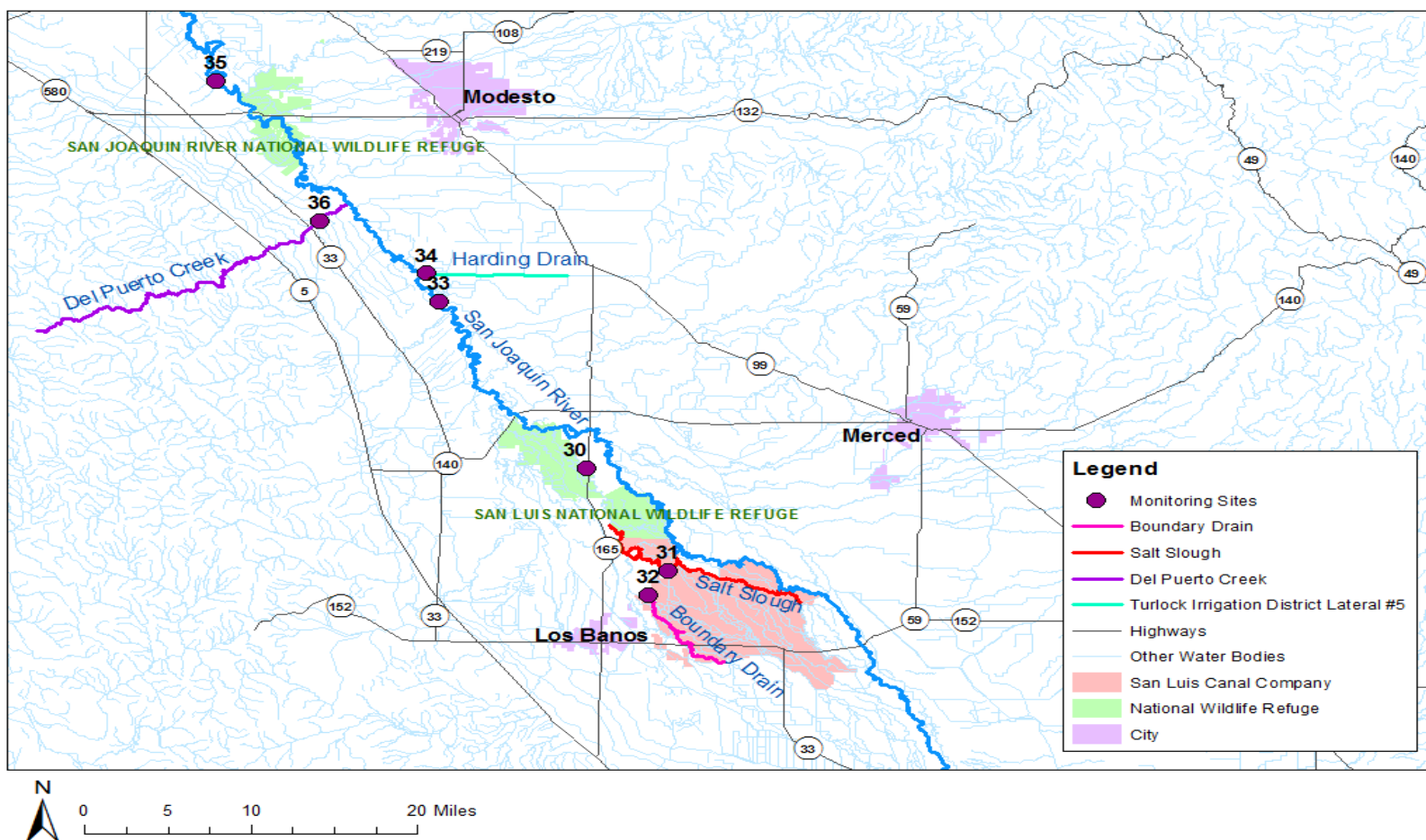


Figure 3 San Joaquin River Monitoring Sites



III.c. Parameters

III.c.1 Field Parameters

Field parameters will include temperature, dissolved oxygen, pH, specific conductivity and turbidity. A YSI EXO1 multiparameter water quality monitor will be used to collect data for temperature, dissolved oxygen, pH and specific conductivity. Turbidity measurements will be collected with a Hach 2100P turbidimeter. The field equipment will be calibrated using certified calibration standards and following the manufacturer specifications prior to and following each sampling event. Calibration records are maintained at the Regional Board office and are used to determine instrument accuracy.

Photos will be taken at each sampling site visited. A digital camera will be used to take one photo upstream of sampling location, one photo looking straight ahead at sampling location, and one photo downstream of sampling location.

III.c.2 Laboratory Analyses

This study will analyze for Maximum Contaminant Levels (MCLs) specified in provisions of Title 22 of the California Code of Regulations, California Toxics Rule (CTR) criteria, and other numeric water quality criteria listed in Appendix A for constituents without a MCL or CTR criteria. For constituents with both a MCL and CTR criteria, the most conservative numeric threshold was selected for water quality evaluation. For constituents without a MCL and CTR criteria, the most appropriate for protecting MUN beneficial use numeric water quality criteria was selected for water quality evaluation.

Table 2 lists the major analytical scans that will be conducted by Excelchem laboratory for each sample site.

E. coli samples will be processed by qualified staff members at the Central Valley Regional Water Quality Control Board using an IDEXX system and methods specified in the Procedures Manual for the San Joaquin River Water Quality Monitoring Program (Central Valley Water Board, 2010).

Table 2 List of Constituents within Each Scan including RLs and MDLs

Scan	Analyte	RL	MDL	Unit	Test Method
Volatile Organic Compounds (VOCs) by GC/MS	1, 1-Dichloroethane	0.5	0.04	µg/L	EPA 8260B
	1,1,1,2-Tetrachloroethane	0.5	0.08	µg/L	EPA 8260B
	1,1,1-Trichloroethane	0.5	0.05	µg/L	EPA 8260B
	1,1,2,2-Tetrachloroethane	0.5	0.4	µg/L	EPA 8260B
	1,1,2-Trichloroethane	0.5	0.1	µg/L	EPA 8260B
	1,1-Dichloroethane	0.5	0.05	µg/L	EPA 8260B
	1,1-Dichloropropene	0.5	0.03	µg/L	EPA 8260B
	1,2,3-Trichlorobenzene	0.5	0.05	µg/L	EPA 8260B
	1,2,3-Trichloropropane	0.5	0.06	µg/L	EPA 8260B
	1,2,4-Trichlorobenzene	0.5	0.02	µg/L	EPA 8260B
	1,2,4-Trimethylbenzene	0.5	0.04	µg/L	EPA 8260B
	1,2-Dibromo-3-chloropropane	0.5	0.07	µg/L	EPA 8260B
	1,2-Dibromoethane (EDB)	0.5	0.1	µg/L	EPA 8260B
	1,2-Dichlorobenzene	0.5	0.06	µg/L	EPA 8260B
	1,2-Dichloroethane	0.5	0.04	µg/L	EPA 8260B
	1,2-Dichloropropane	0.5	0.06	µg/L	EPA 8260B
	1,3-Dichlorobenzene	0.5	0.03	µg/L	EPA 8260B
	1,3-Dichloropropane	0.5	0.06	µg/L	EPA 8260B
	1,4-Dichlorobenzene	0.5	0.05	µg/L	EPA 8260B
	2-Butanone	5.0	0.1	µg/L	EPA 8260B
	2-Chlorotoluene	0.5	0.03	µg/L	EPA 8260B
	2-Hexanone	5.0	0.1	µg/L	EPA 8260B
	4-Chlorotoluene	0.5	0.05	µg/L	EPA 8260B
	4-Isopropyltoluene	0.5	0.04	µg/L	EPA 8260B
	4-Methyl 1-2pentanone	5.0	0.05	µg/L	EPA 8260B
	Acetone	5.0	0.1	µg/L	EPA 8260B
	Benzene	0.5	0.03	µg/L	EPA 8260B
	Bromobenzene	0.5	0.05	µg/L	EPA 8260B
	Bromochloromethane	0.5	0.07	µg/L	EPA 8260B
	Bromodichloromethane	0.5	0.05	µg/L	EPA 8260B
	Bromoform	0.5	0.03	µg/L	EPA 8260B
	Bromomethane	0.5	0.05	µg/L	EPA 8260B
	Carbon disulfide	0.5	0.06	µg/L	EPA 8260B
	Carbon tetrachloride	0.5	0.02	µg/L	EPA 8260B
	Chlorobenzene	0.5	0.03	µg/L	EPA 8260B
	Chloroethane	0.5	0.08	µg/L	EPA 8260B
	Chloroform	0.5	0.05	µg/L	EPA 8260B
	Chloromethane	0.5	0.06	µg/L	EPA 8260B

Scan	Analyte	RL	MDL	Unit	Test Method
VOCs by GC/MS cont'd	cis-1,2-Dichloroethane	0.5	0.03	µg/L	EPA 8260B
	cis-1,3-Dichloropropene	0.5	0.04	µg/L	EPA 8260B
	Dibromochloromethane	0.5	0.07	µg/L	EPA 8260B
	Dibromomethane	0.5	0.07	µg/L	EPA 8260B
	Dichlorodifluoromethane	0.5	0.07	µg/L	EPA 8260B
	Di-isopropyl ether	0.5	0.1	µg/L	EPA 8260B
	Ethyl tert-Butyl Ether	0.5	0.04	µg/L	EPA 8260B
	Ethylbenzene	0.5	0.03	µg/L	EPA 8260B
	Hexachlorobutadiene	0.5	0.07	µg/L	EPA 8260B
	Iodomethane	0.5	0.03	µg/L	EPA 8260B
	Isopropylbenzene	0.5	0.04	µg/L	EPA 8260B
	m,p-Xylene	1.0	0.09	µg/L	EPA 8260B
	Methyl tert-Butyl Ether	0.5	0.05	µg/L	EPA 8260B
	Methylene chloride	5.0	0.08	µg/L	EPA 8260B
	Naphthalene	0.5	0.04	µg/L	EPA 8260B
	n-Butylbenzene	0.5	0.04	µg/L	EPA 8260B
	n-Propylbenzene	0.5	0.04	µg/L	EPA 8260B
	o-Xylene	0.5	0.04	µg/L	EPA 8260B
	sec-Butylbenzene	0.5	0.03	µg/L	EPA 8260B
	TBA	1.0	0.1	µg/L	EPA 8260B
	Tert-Amyl Methyl Ether	0.5	0.03	µg/L	EPA 8260B
	tert-Butylbenzene	0.5	0.02	µg/L	EPA 8260B
	Tetrachloroethene	0.5	0.08	µg/L	EPA 8260B
	Toluene	0.5	0.04	µg/L	EPA 8260B
	trans-1,2-Dichloroethane	0.5	0.04	µg/L	EPA 8260B
	trans-1,3-Dichloropropene	0.5	0.04	µg/L	EPA 8260B
	Trichloroethane	0.5	0.06	µg/L	EPA 8260B
	Trichlorofluoromethane	0.5	0.05	µg/L	EPA 8260B
	Trichlorotrifluoroethane	1.0	0.05	µg/L	EPA 8260B
	Vinyl chloride	0.5	0.06	µg/L	EPA 8260B
	Xylenes, total	1.0	0.1	µg/L	EPA 8260B
	1,1,1,2-Tetrachloroethane	0.5	0.08	µg/L	EPA 524
	1,1,1-Trichloroethane	0.5	0.05	µg/L	EPA 524
	1,1,2,2-Tetrachloroethane	0.5	0.04	µg/L	EPA 524
	1,1,2-Trichloroethane	0.5	0.1	µg/L	EPA 524
	1,1,-Dichloroethane	0.5	0.04	µg/L	EPA 524
	1,1-Dichloroethane	0.5	0.05	µg/L	EPA 524
	1,1-Dichloropropene	0.5	0.03	µg/L	EPA 524
	1,2,3-Trichlorobenzene	0.5	0.05	µg/L	EPA 524

Scan	Analyte	RL	MDL	Unit	Test Method
	1,2,3-Trichloropropane	0.5	0.06	µg/L	EPA 524
VOCs by GC/MS cont'd	1,2,4-Trichlorobenzene	0.5	0.02	µg/L	EPA 524
	1,2,4-Trimethylbenzene	0.5	0.04	µg/L	EPA 524
	1,2-Dibromo-3-chloropropane	0.5	0.07	µg/L	EPA 524
	1,2-Dibromoethane (EDB)	0.5	0.1	µg/L	EPA 524
	1,2-Dichlorobenzene	0.5	0.06	µg/L	EPA 524
	1,2-Dichloroethane	0.5	0.06	µg/L	EPA 524
	1,2-Dichloropropane	0.5	0.06	µg/L	EPA 524
	1,3,5-Trimethylbenzene	0.5	0.03	µg/L	EPA 524
	1,3-Dichlorobenzene	0.5	0.03	µg/L	EPA 524
	1,3-Dichloropropane	0.5	0.06	µg/L	EPA 524
	1,4-Dichlorobenzene	0.5	0.05	µg/L	EPA 524
	2,2-Dichloropropane	0.5	0.06	µg/L	EPA 524
	2-Butanone	5.0	0.1	µg/L	EPA 524
	2-Chlorotoluene	0.5	0.03	µg/L	EPA 524
	2-Hexanone	0.5	0.1	µg/L	EPA 524
	4-Chlorotoluene	0.5	0.05	µg/L	EPA 524
	4-Isopropyltoluene	0.5	0.04	µg/L	EPA 524
	4-Methyl-2-pentanone	0.5	0.05	µg/L	EPA 524
	Acetone	5.0	0.1	µg/L	EPA 524
	Benzene	0.5	0.03	µg/L	EPA 524
	Bromobenzene	0.5	0.05	µg/L	EPA 524
	Bromochloromethane	0.5	0.07	µg/L	EPA 524
	Bromodichloromethane	0.5	0.05	µg/L	EPA 524
	Bromoform	0.5	0.03	µg/L	EPA 524
	Bromomethane	0.5	0.05	µg/L	EPA 524
	Carbon disulfide	0.5	0.06	µg/L	EPA 524
	Carbon tetrachloride	0.5	0.02	µg/L	EPA 524
	Chlorobenzene	0.5	0.03	µg/L	EPA 524
	Chloroethane	0.5	0.08	µg/L	EPA 524
	Chloroform	0.5	0.05	µg/L	EPA 524
	Chloromethane	0.5	0.06	µg/L	EPA 524
	cis-1,2-Dichloroethane	0.5	0.03	µg/L	EPA 524
	cis-1,3-Dichloropropene	0.5	0.04	µg/L	EPA 524
	Dibromochloromethane	0.5	0.07	µg/L	EPA 524
	Dibromomethane	0.5	0.07	µg/L	EPA 524
	Dichlorodifluoromethane	0.5	0.07	µg/L	EPA 524
	Di-isopropyl ether	0.5	0.1	µg/L	EPA 524
	Ethyl tert-Butyl Ether	0.5	0.04	µg/L	EPA 524

Scan	Analyte	RL	MDL	Unit	Test Method
	Ethylbenzene	0.5	0.03	µg/L	EPA 524
	Hexachlorobutadiene	0.5	0.07	µg/L	EPA 524
VOCs by GC/MS cont'd	Iodomethane	0.5	0.03	µg/L	EPA 524
	Isopropylbenzene	0.5	0.04	µg/L	EPA 524
	m,p-Xylene	0.5	0.09	µg/L	EPA 524
	Methyl tert-Butyl Ether	0.5	0.05	µg/L	EPA 524
	Methylene chloride	1.0	0.08	µg/L	EPA 524
	Naphthalene	0.5	0.04	µg/L	EPA 524
	n-Butylbenzene	0.5	0.04	µg/L	EPA 524
	n-Propylbenzene	0.5	0.04	µg/L	EPA 524
	o-Xylene	0.5	0.04	µg/L	EPA 524
	sec-Butylbenzene	0.5	0.03	µg/L	EPA 524
	Styrene	0.5	0.09	µg/L	EPA 524
	TBA	1.0	0.1	µg/L	EPA 524
	Tert-Amyl Methyl Ether	0.5	0.03	µg/L	EPA 524
	tert-Butylbenzene	0.5	0.02	µg/L	EPA 524
	Tetrachloroethene	0.5	0.08	µg/L	EPA 524
	Toluene	0.5	0.04	µg/L	EPA 524
	Total Trihalomethanes	0.5	0.5	µg/L	EPA 524
	trans-1,2-Dichloroethane	0.5	0.04	µg/L	EPA 524
	trans-1,3-Dichloropropene	0.5	0.04	µg/L	EPA 524
	Trichloroethane	0.5	0.06	µg/L	EPA 524
	Trichlorofluoromethane	0.5	0.05	µg/L	EPA 524
	Trichlorotrifluoroethane	1.0	0.05	µg/L	EPA 524
	Vinyl chloride	0.5	0.06	µg/L	EPA 524
	Xylenes, total	1.0	0.1	µg/L	EPA 524
Pesticides by GC/ECD	4,4'-DDD	0.1	0.006	µg/L	EPA 8081A
	4,4'-DDE	0.1	0.005	µg/L	EPA 8081A
	4,4'-DDT	0.1	0.004	µg/L	EPA 8081A
	Aldrin	0.1	0.011	µg/L	EPA 8081A
	alpha-BHC	0.1	0.011	µg/L	EPA 8081A
	alpha-Chlordane	0.1	0.006	µg/L	EPA 8081A
	beta-BHC	0.1	0.011	µg/L	EPA 8081A
	delta-BHC	0.1	0.021	µg/L	EPA 8081A
	Dieldrin	0.1	0.006	µg/L	EPA 8081A
	Endosulfan I	0.1	0.007	µg/L	EPA 8081A
	Endosulfan II	0.1	0.021	µg/L	EPA 8081A
	Endosulfan sulfate	0.1	0.005	µg/L	EPA 8081A
	Endrin	0.1	0.007	µg/L	EPA 8081A

Scan	Analyte	RL	MDL	Unit	Test Method
	Endrin aldehyde	0.1	0.006	µg/L	EPA 8081A
	Endrin Ketone	0.1	0.005	µg/L	EPA 8081A
	gamma-BHC (Lindane)	0.1	0.013	µg/L	EPA 8081A
Pesticides by GC/ECD cont'd	gamma-Chlordane	0.1	0.005	µg/L	EPA 8081A
	Heptachlor	0.1	0.016	µg/L	EPA 8081A
	Heptachlor epoxide	0.1	0.02	µg/L	EPA 8081A
	Methoxychlor	0.1	0.013	µg/L	EPA 8081A
PCBs by GC/ECD	Aroclor 1016	1.00	0.0600	µg/L	EPA 8081A
	Aroclor 1221	1.00	0.130	µg/L	EPA 8081A
	Aroclor 1232	1.00	0.100	µg/L	EPA 8081A
	Aroclor 1242	1.00	0.0600	µg/L	EPA 8081A
	Aroclor 1248	1.00	0.0600	µg/L	EPA 8081A
	Aroclor 1254	1.00	0.0900	µg/L	EPA 8081A
	Aroclor 1260	1.00	0.0800	µg/L	EPA 8081A
	PCBs	1.00	0.0800	µg/L	EPA 8081A
SemiVolatile Organic Compounds by GC/MS	1,2,4-Trichlorobenzene	2.0	0.6	µg/L	EPA 8270C
	1,4-Dichlorobenzene	2.0	0.4	µg/L	EPA 8270C
	2,4,5-Trichlorophenol	5.0	1.6	µg/L	EPA 8270C
	2,4,6-Trichlorophenol	5.0	1.6	µg/L	EPA 8270C
	2,4-Dichlorophenol	2.0	0.8	µg/L	EPA 8270C
	2,4-Dimethylphenol	2.0	0.8	µg/L	EPA 8270C
	2,4-Dinitrophenol	10.0	0.3	µg/L	EPA 8270C
	2,4-Dinitrotoluene	2.0	0.8	µg/L	EPA 8270C
	2,6-Dinitrotoluene	2.0	0.8	µg/L	EPA 8270C
	2-Chloronaphthalene	2.0	0.2	µg/L	EPA 8270C
	2-Chlorophenol	2.0	0.8	µg/L	EPA 8270C
	2-Methylnaphthalene	2.0	0.6	µg/L	EPA 8270C
	2-Methylphenol	2.0	0.4	µg/L	EPA 8270C
	2-Nitroaniline	2.0	0.4	µg/L	EPA 8270C
	2-Nitrophenol	2.0	1.2	µg/L	EPA 8270C
	3,3'-Dichlorobenzidine	5.0	0.8	µg/L	EPA 8270C
	3-Nitroaniline	2.0	0.5	µg/L	EPA 8270C
	4,6-Dinitro-2-methylphenol	10.0	2.2	µg/L	EPA 8270C
	4-Bromophenyl phenyl ether	2.0	0.8	µg/L	EPA 8270C
	4-Chloro-3-methylphenol	2.0	0.6	µg/L	EPA 8270C
	4-Chloroaniline	2.0	0.5	µg/L	EPA 8270C
	4-Chlorophenyl phenyl ether	2.0	0.5	µg/L	EPA 8270C
	4-Nitroaniline	2.0	0.6	µg/L	EPA 8270C
	4-Nitrophenol	5.0	0.1	µg/L	EPA 8270C

Scan	Analyte	RL	MDL	Unit	Test Method
	Acenaphthene	2.0	0.6	µg/L	EPA 8270C
	Acenaphthylene	2.0	0.3	µg/L	EPA 8270C
	Aniline	2.0	0.3	µg/L	EPA 8270C
	Anthracene	2.0	0.3	µg/L	EPA 8270C
SemiVolatile Organic Compounds by GC/MS	Azobenzene	2.0	0.4	µg/L	EPA 8270C
	Benzidine	5.0	0.2	µg/L	EPA 8270C
	Benzo (a) anthracene	2.0	0.4	µg/L	EPA 8270C
	Benzo (a) pyrene	5.0	1.2	µg/L	EPA 8270C
	Benzo (b) fluoranthene	2.0	0.8	µg/L	EPA 8270C
	Benzo (g,h,i) perylene	2.0	1.3	µg/L	EPA 8270C
	Benzo (k) fluoranthene	2.0	1.0	µg/L	EPA 8270C
	Benzoic acid	30.0	0.5	µg/L	EPA 8270C
	Benzyl alcohol	2.0	0.4	µg/L	EPA 8270C
	Bis(2-chloroethoxy)methane	2.0	0.4	µg/L	EPA 8270C
	Bis(2-chloroethyl)ether	2.0	0.6	µg/L	EPA 8270C
	Bis(2-chloroisopropyl)ether	2.0	0.4	µg/L	EPA 8270C
	Bis(2-ethylhexyl)phthalate	5.0	0.7	µg/L	EPA 8270C
	Butyl benzyl phthalate	2.0	1.0	µg/L	EPA 8270C
	Carbazole	2.0	0.6	µg/L	EPA 8270C
	Chrysene	2.0	0.5	µg/L	EPA 8270C
	Dibenz (a,h) anthracene	2.0	1.6	µg/L	EPA 8270C
	Dibenzofuran	2.0	0.3	µg/L	EPA 8270C
	Diethyl phthalate	2.0	0.6	µg/L	EPA 8270C
	Dimethyl phthalate	2.0	0.8	µg/L	EPA 8270C
	Di-n-butyl phthalate	2.0	0.4	µg/L	EPA 8270C
	Di-n-octyl phthalate	5.0	0.7	µg/L	EPA 8270C
	Fluoranthene	2.0	0.6	µg/L	EPA 8270C
	Fluorene	2.0	0.5	µg/L	EPA 8270C
	Hexachlorobenzene	2.0	0.6	µg/L	EPA 8270C
	Hexachlorobutadiene	2.0	0.6	µg/L	EPA 8270C
	Hexachlorocyclopentadiene	2.0	0.6	µg/L	EPA 8270C
	Hexachloroethane	2.0	0.5	µg/L	EPA 8270C
	Indeno (1,2,3-cd) pyrene	5.0	1.6	µg/L	EPA 8270C
	Isophorone	2.0	0.3	µg/L	EPA 8270C
	Naphthalene	2.0	0.5	µg/L	EPA 8270C
	Nitrobenzene	2.0	0.7	µg/L	EPA 8270C
	N-Nitrosodimethylamine	2.0	0.4	µg/L	EPA 8270C
	N-Nitrosodi-n-propylamine	2.0	0.3	µg/L	EPA 8270C
	N-Nitrosodiphenylamine	2.0	0.6	µg/L	EPA 8270C

Scan	Analyte	RL	MDL	Unit	Test Method
	Pentachlorophenol	10.0	2.4	µg/L	EPA 8270C
	Phenanthrene	2.0	0.4	µg/L	EPA 8270C
	Phenol	2.0	0.3	µg/L	EPA 8270C
	Pyrene	2.0	1.0	µg/L	EPA 8270C
Organophosphorus Pesticides	Azinphos-methyl	0.200	0.0270	µg/L	EPA 8141A
Organophosphorus Pesticides cont'd	Bolstar	0.200	0.0860	µg/L	EPA 8141A
	Coumaphos	0.200	0.168	µg/L	EPA 8141A
	Demeton	0.200	0.105	µg/L	EPA 8141A
	Demeton-O	0.200	0.101	µg/L	EPA 8141A
	Demeton-S	0.200	0.105	µg/L	EPA 8141A
	Diazinon	0.250	0.0650	µg/L	EPA 8141A
	Dichlorvos	0.200	0.156	µg/L	EPA 8141A
	Dimethoate	0.200	0.0710	µg/L	EPA 8141A
	Disulfoton	0.200	0.0690	µg/L	EPA 8141A
	Dursban (Chlorpyrifos)	0.200	0.0710	µg/L	EPA 8141A
	EPN	0.200	0.124	µg/L	EPA 8141A
	Ethoprop	0.200	0.0770	µg/L	EPA 8141A
	Fensulfothion	0.200	0.139	µg/L	EPA 8141A
	Fenthion	0.200	0.0670	µg/L	EPA 8141A
	Gardona (Stirophos)	0.200	0.110	µg/L	EPA 8141A
	Malathion	0.200	0.159	µg/L	EPA 8141A
	Merphos	0.200	0.0970	µg/L	EPA 8141A
	Mevinphos	0.200	0.115	µg/L	EPA 8141A
	Molinate	0.200	0.0440	µg/L	EPA 8141A
	Monocrotophos	0.200	0.0150	µg/L	EPA 8141A
	Naled	0.200	0.169	µg/L	EPA 8141A
	Parathion	0.200	0.0790	µg/L	EPA 8141A
	Parathion-methyl	0.200	0.0770	µg/L	EPA 8141A
	Phorate	0.200	0.0830	µg/L	EPA 8141A
	Ronnel	0.200	0.0660	µg/L	EPA 8141A
	Sulfotep	0.200	0.0950	µg/L	EPA 8141A
	TEPP	0.200	0.151	µg/L	EPA 8141A
	Tokuthion (Prothiofos)	0.200	0.0770	µg/L	EPA 8141A
	Trichloronate	0.200	0.0670	µg/L	EPA 8141A
Chlorinated Herbicides	2,4,5-T	0.500	0.0970	µg/L	EPA 8151A
	2,4,5-TP (Silvex)	0.500	0.0950	µg/L	EPA 8151A
	2,4-D	0.400	0.0860	µg/L	EPA 8151A
	2,4-DB	0.800	0.157	µg/L	EPA 8151A
	3,5-Dichlorobenzoic acid	0.800	0.170	µg/L	EPA 8151A

Scan	Analyte	RL	MDL	Unit	Test Method
	4-Nitrophenol	0.600	0.117	µg/L	EPA 8151A
	Acifluorfen	0.800	0.157	µg/L	EPA 8151A
	Bentazon	0.600	0.110	µg/L	EPA 8151A
	Chloramben	0.800	0.00800	µg/L	EPA 8151A
	Dalapon	0.600	0.115	µg/L	EPA 8151A
	DCPA	0.400	0.0150	µg/L	EPA 8151A
Chlorinated Herbicides cont'd	Dicamba	0.400	0.0800	µg/L	EPA 8151A
	Dichloroprop	0.800	0.196	µg/L	EPA 8151A
	Dinoseb	0.400	0.0830	µg/L	EPA 8151A
	MCP	10.0	0.891	µg/L	EPA 8151A
	Pentachlorophenol	0.300	0.0530	µg/L	EPA 8151A
	Picloram	0.800	0.0200	µg/L	EPA 8151A
Ion Chromatography	Hexavalent Chromium	1.0	0.1	µg/L	EPA 218.6
	Chloride	0.5	0.04	mg/L	EPA 300.0
	Fluoride	0.1	0.02	mg/L	EPA 300.0
	Nitrate as Nitrogen	0.11	0.009	mg/L	EPA 300.0
	Nitrite as Nitrogen	0.15	0.03	mg/L	EPA 300.0
	Sulfate as SO ₄	5.0	0.7	mg/L	EPA 300.0
	Perchlorate	2.00	0.0940	µg/L	EPA 314.0
Wet Chemistry	Specific Conductance (EC)	5.00	1.09	µS/cm	EPA 120.1
	Total Dissolved Solids	15.0	7.68	mg/L	SM 2540C
	Cyanide	0.00500	0.000900	mg/L	SM 4500CN E
	pH	0.100	0.100	pH Units	SM 4500-H+ B
	Ammonia as N	0.100	0.0400	mg/L	SM 4500- NH ₃ B/H
	MBAS	0.100	0.0600	mg/L	SM 5540C
	Total Alkalinity	5.00	2.37	mg/L	SM2320B
	Total Hardness	5.00	2.86	mg/L	SM2340B
Total Recoverable Metals	Aluminum	50.0	24.5	µg/L	EPA 200.7
	Antimony	10.0	1.3	µg/L	EPA 200.7
	Arsenic	10.0	1.0	µg/L	EPA 200.7
	Barium	5.0	1.2	µg/L	EPA 200.7
	Beryllium	5.0	0.09	µg/L	EPA 200.7
	Boron	50.0	0.8	µg/L	EPA 200.7
	Cadmium	5.0	0.1	µg/L	EPA 200.7
	Calcium	100	79.0	µg/L	EPA 200.7
	Chromium	5.0	0.3	µg/L	EPA 200.7
	Copper	5.0	0.8	µg/L	EPA 200.7
	Iron	20.0	11.5	µg/L	EPA 200.7

Scan	Analyte	RL	MDL	Unit	Test Method
	Lead	5.0	0.9	µg/L	EPA 200.7
	Magnesium	50.0	15.6	µg/L	EPA 200.7
	Manganese	10.0	0.6	µg/L	EPA 200.7
	Nickel	5.0	0.6	µg/L	EPA 200.7
	Selenium	20.0	1.3	µg/L	EPA 200.7
	Silver	5.0	0.4	µg/L	EPA 200.7
	Sodium	200	120	µg/L	EPA 200.7
Total Recoverable Metals con'td	Thallium	20.0	2.2	µg/L	EPA 200.7
	Titanium	50.0	1.2	µg/L	EPA 200.7
	Zinc	10.0	0.3	µg/L	EPA 200.7
Dissolved Metals	Dissolved Aluminum	50.0	24.5	µg/L	EPA 200.7
	Dissolved Arsenic	10.0	1.0	µg/L	EPA 200.7
	Dissolved Iron	20.0	11.5	µg/L	EPA 200.7
	Dissolved Lead	5.0	0.9	µg/L	EPA 200.7
Dioxin/Furan	1,2,3,4,6,7,8-HpCDD	50	2.17	pg/L	1613B
	1,2,3,4,6,7,8-HpCDF	50	3.77	pg/L	1613B
	1,2,3,4,7,8,9-HpCDF	50	4.61	pg/L	1613B
	1,2,3,4,7,8-HxCDD	50	3.98	pg/L	1613B
	1,2,3,4,7,8-HxCDF	50	3.66	pg/L	1613B
	1,2,3,6,7,8-HxCDD	50	5.34	pg/L	1613B
	1,2,3,6,7,8-HxCDF	50	3.97	pg/L	1613B
	1,2,3,7,8,9-HxCDD	50	4.68	pg/L	1613B
	1,2,3,7,8,9-HxCDF	50	8.74	pg/L	1613B
	1,2,3,7,8-PeCDD	50	2.29	pg/L	1613B
	1,2,3,7,8-PeCDF	50	2.58	pg/L	1613B
	2,3,4,6,7,8-HxCDF	50	4.97	pg/L	1613B
	2,3,4,7,8-PeCDF	50	2.36	pg/L	1613B
	2,3,7,8-TCDD	10	2.20	pg/L	1613B
	2,3,7,8-TCDF	10	2.01	pg/L	1613B
	OCDD	100	4.32	pg/L	1613B
	OCDF	100	6.25	pg/L	1613B
	TEQ			pg/L	1613B
	Total HpCDD	50	3.06	pg/L	1613B
	Total HpCDF	50	4.61	pg/L	1613B
	Total HxCDD	50	5.34	pg/L	1613B
	Total HxCDF	50	8.74	pg/L	1613B
	Total PeCDD	50	2.29	pg/L	1613B
	Total PeCDF	50	2.58	pg/L	1613B
	Total TCDD	10	2.20	pg/L	1613B

Scan	Analyte	RL	MDL	Unit	Test Method
	Total TCDF	10	2.01	pg/L	1613B

NOTE: RL is Reporting Limit

MDL is Method Detection Limit

GC/MS is Gas Chromatography—Mass Spectrometry

GC/ECD is Gas Chromatography—Electron Capture Detector

III.d. Frequency of Sampling

All field parameters, bacteria and chemical parameters (see Table 2) will be monitored once at all 11 sites.

III.e. Spatial and Temporal Scale

Sampling sites are located along the Sacramento and San Joaquin River upstream and downstream of the agricultural drain inflows and in the major agricultural drains. The study will be conducted on June 25, 2014 (Sacramento River Basin sites) and June 30, 2014 (San Joaquin River Basin sites)—a production period for irrigated agriculture.

III.f. Data Management

All data from this study will be managed in accordance with the California Environmental Data Exchange Network (CEDEN) templates provided by the Central Valley Regional Data Center. The Central Valley Water Board will load field sheet, field parameters, flow, and chemical parameters data into the templates provided from the Regional Data Center. The time period to enter all data from this study into the templates will be determined when more resources become available.

When the data is entered into the CEDEN Database, the data can then be accessed by the public through the CEDEN website. Information on CEDEN is available at www.ceden.org.

IV. REVIEW STRATEGY

This document will be reviewed by SWAMP, ILRP and CV-SALTS program staff from the Central Valley Water Board. The final study report will be provided for review to the same Central Valley Water Board programs and the stakeholder committee that has been providing input on a project evaluating appropriate beneficial use designations in agricultural dominated water bodies.

V. QUALITY ASSURANCE

Synoptic Evaluation of Drinking Water Constituents of Concern in the Sacramento and San Joaquin River Basins Final Monitoring Plan, Nov 2014

All aspects of this study, including all samples and field measurements collected, will be conducted in accordance with the 2008 SWAMP Quality Assurance Program Plan (QAPrP) for the State of California's Surface Water Ambient Monitoring Program (State Water Board, 2008) and the Procedures Manual for the San Joaquin River Water Quality Monitoring Program (Central Valley Water Board, 2010).

Blind field replicates will be collected at one site for each of the separate runs, to meet SWAMP's 10% frequency specification. Sample bottles will be provided by Excelchem Environmental Labs. Water samples will be bottled appropriately based on whether they come pre-preserved or need to be held at <10°C. Travel and laboratory blanks will be used for each batch of bottles collected and processed. Chain-of-custody documentation will be maintained for all samples.

V.a. Field Equipment

A YSI multiparameter water quality monitor will be used to collect data for temperature, dissolved oxygen, pH and specific conductivity. Turbidity measurements will be collected with a Hach turbidimeter. The field equipment are calibrated using certified calibration standards and manufacturer specifications prior to each sampling event and the calibration is checked for accuracy following each sampling event. Calibration records are maintained at the Central Valley Water Board offices and are used to determine instrument accuracy. A digital camera will be used to take sampling site photos. Specific model numbers and calibration dates for the field equipment will be noted on the field sheets and in the final report.

V.b. Laboratory Methods and Costs

Most lab analyses will be conducted by Excelchem Environmental Labs in Rocklin, CA. The *E. coli* samples will be processed by qualified staff members at the Central Valley Regional Water Quality Control Board.

Sampling cost estimates are outlined in Table 3 and include submittal of four QA/QC samples.

Table 3 Laboratory Costs for Key Constituents and All Scans

Analysis	Test Method	Cost
Polychlorinated Biphenyls (PCB's)	8082A	\$ 60.00
GC/MS Semivolatiles	8270C	\$ 75.00

Volatile Organic Compound & Oxygenated Additive	8260B	\$ 125.00
Poly-Chlorinated-Dibenzo-p-Dioxin/Furan HRMS	1613B	\$ 500.00
Drinking Water Volatile Organic Compounds	524.2	\$ 80.00
Organo-Chlorinated Pesticide	8081A	\$ 60.00
Organo-Phosphorus Pesticide	8141A	\$ 60.00
Chlorinated Herbicide	8151A	\$ 60.00
1,2-DB-3-CP; 1,2-DCEthene; 1,2,3-TCPPane	8260B	\$ 40.00
Perchlorate	314.1	\$ 50.00
Alumnium	200.7/200.8	\$ 15.00
Barium	200.7/200.8	\$ 4.00
Boron	200.7/200.8	\$ 15.00
Iron	200.7/200.8	\$ 15.00
Thallium	200.7/200.8	\$ 4.00
Antimony, Beryllium, Cadmium, Chromium, Copper, Lead, Nickel, Selenium, Silver, Titanium, Zinc, Arsenic, Throium, Chromium 4	200.8 ICP/MS	\$ 80.00
Flouride Salts	300	\$ 5.00
Ammonia Nitrogen	4500-NH3	\$ 30.00
Nitrate Nitrogen	300	\$ 30.00
Nitrite Nitorgen	300	\$ 10.00
Title 22 General Minerals: Alkalinity, Calcium, Chloride, Copper, Iron, Methylene Blue Active Substances (MBAs), Manganese, Magnesium, pH, Sodium, Sulfate, Total Dissolved Solids (TDS), Total Hardness, Total Conductivity, Zinc		\$ 105.00
Alumnium (dissolved)	200.7	\$ 15.00
Arsenic (dissolved)	200.7	\$ 20.00
Lead (dissolved)	200.7	\$ 15.00
Iron (dissolved)	200.7	\$ 15.00
Dissolved filtering fee \$20/hour/sample (4 dissolved metals)		\$ 80.00
Total per Site:		\$ 1,568.00
Total for 11 Sites		\$ 17,248.00
DI water \$10.00/gallon (6 gallons)		\$ 60.00
QA Samples per Study Area		\$ 3,261.00
Total QA Samples for all Study Areas		\$ 6,522.00
Level III QA/QC package \$10/hour (15 total samples)		\$ 150.00
Grand Total for Key Constituents and All Scans (11 sites + QA)		\$ 23,770.00

Table 4 Estimated Analytical Cost by Study Area

Study Area	# Sites	# QA Samples	Cost
Sacramento River	4	2	\$9,498.00
San Joaquin River	7	2	\$14,232.00
Total:	11	4	\$23,730.00

VI. REFERENCES

California Regional Water Quality Control Board, Central Valley Region, Central Valley Water Board. 2008. SWAMP Quality Assurance Program Plan.

California Regional Water Quality Control Board, Central Valley Region, Central Valley Water Board. 2011. The Water Quality Control Plan for the Sacramento River Basin and San Joaquin River Basin (Basin Plan), 4th Edition.

California Regional Water Quality Control Board, Central Valley Region, Central Valley Water Board. 2010. Procedures Manual for the San Joaquin River Water Quality Monitoring Program.

APPENDIX A: PARAMETERS AND CRITERIAS

The following list all of the constituents that have MUN water quality evaluation criteria. Please note that not all of these constituents were tested for due to scan variations provided by each laboratory.

Analyte	Primary MCL	Secondary MCL	CTR	Other Evaluation Criteria/Guidelines
1,1,1-Trichloroethane	0.200 mg/L			1.0 mg/L [California Public Health Goal for Drinking Water]
1,1,2,2-Tetrachloroethane	0.001 mg/L		0.00017 mg/L	0.0001 mg/L [California Public Health Goal for Drinking Water]
1,1,2,Trichloro-1,2,2-Trifluoroethane (Freon 113)	1.2 mg/L			4.0 mg/L [California Public Health Goal for Drinking Water]
1,1,2-Trichloroethane	0.005 mg/L		0.0006 mg/L	0.0003 mg/L [California Public Health Goal for Drinking Water]
1,1-Dichloroethane	0.005 mg/L			0.003 mg/L [California Public Health Goal for Drinking Water]
1,1-Dichloroethylene	0.006 mg/L		0.000057 mg/L	0.010 mg/L [California Public Health Goal for Drinking Water]
1,2,4-Trichlorobenzene	0.005 mg/L			0.005 mg/L [California Public Health Goal for Drinking Water]
1,2,4-Trimethylbenzene				0.330 mg/L [California DPH Notification Level for drinking water]

Analyte	Primary MCL	Secondary MCL	CTR	Other Evaluation Criteria/Guidelines
1,2-Dibromo-3chloropropane (DBCP)	0.0002 mg/L			0.0000017 mg/L [California Public Health Goal for Drinking Water]
1,2-Dibromoethane (Ethylene Dibromide) (EDB)	0.00005 mg/L			0.00001 [California Public Health Goal for Drinking Water]
1,2-Dichlorobenzene	0.6 mg/L		2.7 mg/L	0.6 mg/L [California Public Health Goal for Drinking Water]
1,2-Dichloroethane (Ethylene dichloride)	0.0005 mg/L		0.00038 mg/L	0.0004 mg/L [California Public Health Goal for Drinking Water]
1,2-Dichloropropane	0.005 mg/L		0.00052 mg/L	0.00050 mg/L [California Public Health Goal for Drinking Water]
1,2-Diphenylhydrazine			0.000040 mg/L	
1,3 Dichlorobenzene			0.400 mg/L	0.600 mg/L [California DPH Notification Level for drinking water]
1,3,5-Trimethylbenzene				0.330 [California DPH Notification Level for drinking water]
1,3-Dichloropropene	0.0005 mg/L		0.01 mg/L	0.0002 mg/L [California Public Health Goal for Drinking Water]
1,4-Dichlorobenzene	0.005 mg/L		0.400 mg/L	0.006 mg/L [California Public Health Goal for Drinking Water]

Analyte	Primary MCL	Secondary MCL	CTR	Other Evaluation Criteria/Guidelines
2,3,7,8-TCDD (Dioxin)	3 x 10 ⁻⁸ mg/L		1.3 x 10 ⁻¹¹ mg/L	5 x 10 ⁻¹¹ mg/L [California Public Health Goal for Drinking Water]
2,4,5-TP (Silvex)	0.05 mg/L			0.002 mg/L [California Public Health Goal for Drinking Water]
2,4,6-Trichlorophenol			0.0021 mg/L	
2,4-Dichlorophenol			0.093 mg/L	
2,4-Dichlorophenoxyacetic acid (2,4-D)	0.07 mg/L			0.02 mg/L [California Public Health Goal for Drinking Water]
2,4-Dichlorophenoxybutyric acid (2,4-DB)				0.056 mg/L [USEPA IRIS Reference Dose]
2,4-Dimethylphenol			0.540 mg/L	
2,4-Dinitrophenol			0.070 mg/L	
2,4-Dinitrotoluene			0.00011 mg/L	
2-Chloronaphthalene			1.7 mg/L	
2-Chlorophenol			0.120 mg/L	
2-Methyl-4,6-Dinitrophenol			0.0134 mg/L	

Analyte	Primary MCL	Secondary MCL	CTR	Other Evaluation Criteria/Guidelines
3,3'-Dichlorobenzidine			0.00004 mg/L	
4,4'-DDD			0.00000083 mg/L	0.00015 mg/L [Cal/EPA Cancer Potency Factor as a drinking water level (assume 70kg body weight & 2 liters per day drinking water consumption)]
4,4'-DDE			0.00000059 mg/L	0.0001 mg/L [Cal/EPA Cancer Potency Factor as a drinking water level (assume 70kg body weight & 2 liters per day drinking water consumption)]
4,4'-DDT			0.00000059 mg/L	0.0001 mg/L [Cal/EPA Cancer Potency Factor as a drinking water level (assume 70kg body weight & 2 liters per day drinking water consumption)]
Acenaphthene			1.2 mg/L	0.020 mg/L [USEPA National Recomm. WQ Criteria, taste & odor]
Acrolein			0.320 mg/L	0.110 mg/L [Odor threshold (Amoore and Hautala)]
Acrylonitrile			0.000059 mg/L	
Alachlor	0.002 mg/L			0.004 mg/L [California Public Health Goal for Drinking Water]

Analyte	Primary MCL	Secondary MCL	CTR	Other Evaluation Criteria/Guidelines
Aldrin			0.00000013 mg/L	0.0000021 mg/L [Cal/EPA Cancer Potency Factor as a drinking water level (assume 70kg body weight & 2 liters per day drinking water consumption)]
Alpha-BHC (alpha-Benzene hexachloride)			0.0000039 mg/L	0.000013 mg/L [Cal/EPA Cancer Potency Factor as a drinking water level (assume 70kg body weight & 2 liters per day drinking water consumption)]
Aluminum	1.0 mg/L	0.2 mg/L		0.600 mg/L [California Public Health Goal for Drinking Water]
Ammonia				1.5 mg/L [Odor threshold (Amoore and Hautala)]
Anthracene			9.6 mg/L	
Antimony	0.006 mg/L		.0014 mg/L	0.020 mg/L [California Public Health Goal for Drinking Water]
Arsenic	0.010 mg/L			0.000004 mg/L [California Public Health Goal for Drinking Water]
Asbestos	7 Million Fibers per Liter		7 Million Fibers/Liter	
Atrazine	0.001 mg/L			0.00015 mg/L [California Public Health Goal for Drinking Water]

Analyte	Primary MCL	Secondary MCL	CTR	Other Evaluation Criteria/Guidelines
Barium	1.0 mg/L			2.0 mg/L [California Public Goal for Drinking Water]
Bentazon	0.018 mg/L			
Benzene	0.001 mg/L		0.0012 mg/L	0.00015 mg/L [California Public Health Goal for Drinking Water]
Benzidine			0.00000012 mg/L	
Benzo(a)Anthracene [1,2-Benzanthracene]			0.0000044 mg/L	0.000029mg/L [Cal/EPA Cancer Potency Factor as a drinking water level (assume 70kg body weight & 2 liters per day drinking water consumption)]
Benzo(a)pyrene	0.0002 mg/L		0.0000044 mg/L	0.000007mg/L [Cal/EPA Cancer Potency Factor as a drinking water level (assume 70kg body weight & 2 liters per day drinking water consumption)]
Benzo(b)Fluoranthene [3,4-Benzofluoranthene]			0.0000044 mg/L	0.000029mg/L [Cal/EPA Cancer Potency Factor as a drinking water level (assume 70kg body weight & 2 liters per day drinking water consumption)]

Analyte	Primary MCL	Secondary MCL	CTR	Other Evaluation Criteria/Guidelines
Benzo(k)Fluoranthene			0.0000044 mg/L	0.000029mg/L [Cal/EPA Cancer Potency Factor as a drinking water level (assume 70kg body weight & 2 liters per day drinking water consumption)]
Beryllium	0.004 mg/L			0.001 mg/L [California Public Health Goal for Drinking Water]
Beta/photon emitters	4 millirem/year annual dose equivalent to the total body or any internal organ			
Beta-BHC (beta-Benzene hexachloride)			0.000014 mg/L	0.000023 mg/L [Cal/EPA Cancer Potency Factor as a drinking water level (assume 70kg body weight & 2 liters per day drinking water consumption)]
Bis(2-Chloroethyl)Ether			0.000031 mg/L	
Bis(2-Chloroisopropyl)Ether			1.400 mg/L	
Boron				1 mg/L [California Public Health Goal for Drinking Water]
Bromoform			0.0043 mg/L	0.004 mg/L USEPA IRIS Cancer Risk Level

Analyte	Primary MCL	Secondary MCL	CTR	Other Evaluation Criteria/Guidelines
Butylbenzyl Phthalate			3.0 mg/L	
Cadmium	0.005 mg/L			0.00004 mg/L [California Public Health Goal for Drinking Water]
Carbofuran	0.04 mg/L			
Carbon Tetrachloride	0.0005 mg/L			0.00025 mg/L [National Toxics Rule (NTR) for sources of drinking water]
Chlordane	0.0001 mg/L		0.00000057 mg/L	0.00003 mg/L [California Public Health Goal for Drinking Water]
Chloride		250 mg/L		
Chlorobenzene	0.070 mg/L		0.680 mg/L	
Chlorodibromomethane			0.00041 mg/L	
Chloroform				0.0018 mg/L [Cal/EPA Cancer Potency Factor as a drinking water level (assume 70kg body weight & 2 liters per day drinking water consumption)]
Chlorpyrifos				0.002 mg/L [USEPA, OPP Drinking Water Health Advisory - non-cancer]
Chromium	0.05 mg/L			

Analyte	Primary MCL	Secondary MCL	CTR	Other Evaluation Criteria/Guidelines
Chrysene			0.0000044 mg/L	0.00029 mg/L [Cal/EPA Cancer Potency Factor as a drinking water level (assume 70kg body weight & 2 liters per day drinking water consumption)]
Cis1,2-Dichloroethylene	0.006 mg/L			0.100 mg/L [California Public Health Goal for Drinking Water]
Color		15 Units		
Copper		1.0 mg/L	1.3 mg/L	0.300 mg/L [California Public Health Goal for Drinking Water]
Cyanide	0.15 mg/L		0.700 mg/L	0.150 mg/L [California Public Health Goal for Drinking Water]
Dalapon	0.2 mg/L			0.790 mg/L [California Public Health Goal for Drinking Water]
Di(2-ethylhexyl)adipate	0.4 mg/L			
Di(2-ethylhexyl)phthalate (DEHP) (Bis(2-ethylhexyl) phthalate)	0.004 mg/L			0.0018 mg/L [National Toxics Rule (NTR) for sources of drinking water]
Diazinon				0.0012 mg/L [CDPH Notification Level for drinking water]

Analyte	Primary MCL	Secondary MCL	CTR	Other Evaluation Criteria/Guidelines
Dibenzo(ah)Anthracene			0.0000044 mg/L	0.0000085 [Cal/EPA Cancer Potency Factor as a drinking water level (assume 70kg body weight & 2 liters per day drinking water consumption)]
Dichlorobromomethane			0.00056 mg/L	0.00027 mg/L [Cal/EPA Cancer Potency Factor as a drinking water level (assume 70kg body weight & 2 liters per day drinking water consumption)]
Dichloromethane (Methylene Chloride)	0.005 mg/L		0.0047 mg/L	0.0004 mg/L [California Public Health Goal for Drinking Water]
Dieldrin			0.00000014 mg/L	0.0000022 mg/L [Cal/EPA Cancer Potency Factor as a drinking water level (assume 70kg body weight & 2 liters per day drinking water consumption)]
Diethyl Phthalate			23 mg/L	
Di-isopropyl ether (Isopropyl ether) (DIPE)				0.0008 mg/L [Odor threshold (Amoore and Hautala)]
Dimethyl Phthalate			313 mg/L	
Di-n-Butyl Phthalate			2.7 mg/L	

Analyte	Primary MCL	Secondary MCL	CTR	Other Evaluation Criteria/Guidelines
Dinoseb	0.007 mg/L			0.014 mg/L [California Public Health Goal for Drinking Water]
Diquat	0.02 mg/L			
<i>E. coli</i>				200 MPN/100 mL [CDPH trigger for possible reductions in pathogen levels]
Endosulfan I (Alpha-Endosulfan)			0.110 mg/L	0.042 mg/L [USEPA IRIS Reference Dose]
Endosulfan II (Beta-Endosulfan)			0.110 mg/L	0.042 mg/L [USEPA IRIS Reference Dose]
Endosulfan Sulfate	0.002 mg/L		0.110 mg/L	
Endothall	0.1 mg/L			
Endrin	0.002 mg/L		0.00076 mg/L	0.0018 mg/L [California Public Health Goal for Drinking Water]
Endrin Aldehyde			0.00076 mg/L	
Ethylbenzene	0.3 mg/L		3.1 mg/L	0.0032 mg/L [Cal/EPA Cancer Potency Factor as a drinking water level (assume 70kg body weight & 2 liters per day drinking water consumption)]
Fluoranthene			0.3 mg/L	0.280 mg/L [USEPA IRIS Reference Dose]
Fluorene			1.3 mg/L	0.280 mg/L [USEPA IRIS Reference Dose]

Analyte	Primary MCL	Secondary MCL	CTR	Other Evaluation Criteria/Guidelines
Fluoride		2.0 mg/L		1.0 mg/L [California Public Health Goal for Drinking Water]
Foaming Agents (MBAS)		0.5 mg/L		
Gamma-BHC (gamma-Benzene hexachloride) (Lindane)	0.0002 mg/L		0.000019 mg/L	0.000032 mg/L [California Public Health Goal for Drinking Water]
Glyphosate	0.7 mg/L			
Gross Alpha particle activity (excluding radon and uranium)	15 pCi/L			
Heptachlor	0.0004 mg/L		0.00000021 mg/L	0.000008 mg/L [California Public Health Goal for Drinking Water]
Heptachlor Epoxide	0.0002 mg/L		0.00000010 mg/L	
Hexachlorobenzene	0.001 mg/L		0.00000075 mg/L	
Hexachlorobutadiene			0.00044 mg/L	
Hexachlorocyclopentadiene	0.05 mg/L		0.240 mg/L	
Hexachloroethane			0.0019 mg/L	

Analyte	Primary MCL	Secondary MCL	CTR	Other Evaluation Criteria/Guidelines
Indeno(1,2,3-cd) Pyrene			0.0000044 mg/L	0.000029 mg/L [Cal/EPA Cancer Potency Factor as a drinking water level (assume 70kg body weight & 2 liters per day drinking water consumption)]
Iron		0.3 mg/L		
Isophorone			0.0084 mg/L	
Lead	0.015 mg/L			0.0002 mg/L California Public Health Goal for Drinking Water]
Manganese		0.05 mg/L		0.500 mg/L [California DPH Notification Level for drinking water]
Mercury	0.002 mg/L		0.000050 mg/L	0.0012 mg/L [California Public Health Goal for Drinking Water]
Methoxychlor	0.03 mg/L			0.00009 mg/L [California Public Health Goal for Drinking Water]
Methyl Bromide (Bromomethane)			0.048 mg/L	
Methyl-tert-butyl ether (MTBE)	0.013 mg/L	0.005 mg/L		0.013 mg/L [California Public Health Goal for Drinking Water]
Molinate	0.02 mg/L			
Monochlorobenzene	0.1 mg/L			

Analyte	Primary MCL	Secondary MCL	CTR	Other Evaluation Criteria/Guidelines
Nickel	0.100 mg/L		0.61 mg/L	0.012 mg/L [California Public Health Goal for Drinking Water]
Nickel	0.1 mg/L		0.610 mg/L	0.012 mg/L [California Public Health Goal for Drinking Water]
Nitrate (as NO3)	45 mg/L			
Nitrate+Nitrite (sum as nitrogen)	10 mg/L			
Nitrite (as Nitrogen)	1.0 mg/L			
Nitrobenzene			0.017 mg/L	
N-Nitrosodimethylamine (NDMA)			0.00000069 mg/L	0.000003 mg/L [California Public Health Goal for Drinking Water]
N-Nitrosodi-n-Propylamine			0.000005 mg/L	
N-Nitrosodiphenylamine			0.005 mg/L	
Odor		3 TON (Threshold Odor Number)		
Oxamyl	0.2 mg/L			

Analyte	Primary MCL	Secondary MCL	CTR	Other Evaluation Criteria/Guidelines
Pentachlorophenol	0.001 mg/L		0.00028 mg/L	0.0003 mg/L [California Public Health Goal for Drinking Water]
Perchlorate	0.006 mg/L			0.006 mg/L [California Public Health Goal for Drinking Water]
pH		6.5 - 8.5		
Phenol			21.0 mg/L	
Picloram	0.5 mg/L			
Polychlorinated Biphenyls (PCBs)	0.0005 mg/L		0.00000017 mg/L	0.00009 mg/L California Public Health Goal for Drinking Water]
Pyrene			0.960 mg/L	0.210 mg/L [USEPA IRIS Reference Dose]
Radium-226	5 pCi/L (combined radium-226 & - 228)			
Radium-228	5 pCi/L (combined radium-226 & - 228)			
Selenium	0.05 mg/L			0.03 mg/L [California Public Health Goal for Drinking Water]
Silver		0.1 mg/L		0.035 mg/L [USEPA IRIS Reference Dose]

Analyte	Primary MCL	Secondary MCL	CTR	Other Evaluation Criteria/Guidelines
Simazine	0.004 mg/L			
Sodium				20 mg/L [USEPA Drinking Water Advisory (for persons on restricted sodium diet)]
Specific Conductance		900 μ S/cm		
Strontium-90	8 pCi/L (=4 millirem/yr dose to bone marrow)			
Styrene	0.1 mg/L			
Sulfate		250 mg/L		
Tetrachloroethylene (Tetrachloroethene) (PCE)	0.005 mg/L		0.0008 mg/L	0.0006 mg/L [California Public Health Goal for Drinking Water]
Thallium	0.002 mg/L		0.0017 mg/L	0.0001 mg/L [California Public Health Goal for Drinking Water]
Thiobencarb	0.07 mg/L	0.001 mg/L		
Toluene	0.15 mg/L		6.800 mg/L	0.150 [California Public Health Goal for Drinking Water]
Total Dissolved Solids		500 mg/L		
Total Trihalomethanes	0.080 mg/L			

Analyte	Primary MCL	Secondary MCL	CTR	Other Evaluation Criteria/Guidelines
Toxaphene	0.003 mg/L		0.00000073 mg/L	0.00003 mg/L [California Public Health Goal for Drinking Water]
Trans-1,2-Dichloroethylene	0.01 mg/L		0.700 mg/L	0.00060 mg/L [California Public Health Goal for Drinking Water]
Trichloroethylene (TCE)	0.005 mg/L		0.0027 mg/L	0.0017 mg/L [California Public Health Goal for Drinking Water]
Trichlorofluoromethane (Freon 11)	0.15 mg/L			1.3 mg/L [California Public Health Goal for Drinking Water]
Tritium	20000 pCi/L (=4 millirem/yr dose to total body)			
Turbidity		5 NTU		
Uranium	20 pCi/L			
Vanadium				0.050 mg/L [California DPH Notification Level for drinking water]
Vinyl Chloride	0.0005 mg/L		0.002 mg/L	0.00005 mg/L [California Public Health Goal for Drinking Water]
Xylenes	1.750 mg/L			1.80 mg/L [California Public Health Goal for Drinking Water]
Zinc		5.0 mg/L		2.1 mg/L [USEPA IRIS Reference Dose]